Measuring Effectiveness of TV Advertising for Heterogeneous Consumer

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論文内容の要旨

In marketing activities, managers have to decide advertising goal, to optimize budget, to select medias, and to make media schedules, etc. Through this advertising management process, advertising reaches consumers. However, manager's intention included in advertising is not always achieved, because advertising messages are influenced by various noises. Therefore, managers should collect the relevant information that supports their decision-making at any stage of the management process. Additionally, in order to make better plan in next time, managers need to measure the effectiveness of advertising and evaluate this time planning.

Advertising has various kinds of effects. The effects of advertising are divided into two types. First are main effects which include short-term effect and long-term effect on sales, carryover effect, hysteresis, and threshold effect, etc. Second are interactive effects which include price-advertising interaction, brand preference-advertising interaction, and advertising interaction with order of entry and number of competitors. In this paper we deal with the main effects, especially focus on the short-term and long-term effect on individual brand choice, carryover effect, and threshold effect of advertising.

For previous researches on those effects of advertising, most of studies used aggregated or macro data to measure the effectiveness of advertising. However, advertising is stocked into individual consumers. So, it is adequate to measure the effect of advertising using not aggregated data but disaggregated data across consumers. In addition, recent trend of marketing, that is one-to-one marketing, needs individual consumer level analysis. So, we proposed the model to measure the individual consumer's effects of advertising and got estimates for each household by applying the model to single-source data. Furthermore, we obtained a lot of implications which are useful for marketing management.

Summary of each chapter follows.

In chapter 2, we proposed the base model, which was made improvements in later chapter, to measure the short-term and long-term effectiveness of advertising for each consumer. In this model, advertising stock variable which is composed from advertising exposure data recorded in single-source data and advertising carryover parameter was used in analysis. Then, we reported some empirical results by applying the hierarchical Bayes Probit model to single-source data: The model with consumer heterogeneous advertising carryover parameter was better model than the consumer homogeneous advertising carryover model. The posterior distributions of advertising response parameter and carryover parameter are not always unimodal. Households with high variety-seeking respond greater to latest advertising than past advertising exposure. Long-term effect of advertising was 1.51 times short-term effect.

Chapter 3 intended to measure the long-term effectiveness of advertising not only for each household but also for each brand by using brand-specific advertising carryover. In this chapter, we showed superiority of the model, which assumes both household heterogeneity and brand heterogeneity, dominates other model assuming homogeneity across households. Then, we observed that long-term effects of advertising were 1.916 times the household average of the short-term effect in a brand, which has the highest household average of carryover parameter. Furthermore, household exposed to advertising more frequently has lower advertising carryover.

In Chapter 4, we proposed the model to estimate the advertising threshold for each household and found that the derived posterior distribution of threshold parameter is not symmetric nor spherically distributed. Then, the results of hierarchical modeling showed that households with large family size and the more frequent shopper tend to have high level of advertising threshold.

Heterogeneous distribution of each parameter shown in chapter 2, 3, 4 suggest that an analysis assuming homogeneity of consumers to facilitate pooling of data into one representative consumer have possibilities to bring managers inappropriate decision-making.

Finally, we proposed the advertising management model in chapter 5. The model enables managers

to measure the effectiveness of advertising not using the advertising exposure data but the spot data. In this chapter, we showed incremental advertising stock and share. The simulation indicated that effects of changing TV spots vary across brands, and advertising for a brand would be mostly working to keep current levels of advertising stock effective. In addition, we implemented segmentation analysis based on the result of hierarchical model, and observed that decrease of TV spots for households with mostly female give rise to large loss of share.

論文審査結果の要旨

本論文では、テレビ広告のシングルソース・データを用いて消費者異質性を考慮した広告効果の測定モデルを新しく開発し、その実務上の有効性を実証している。

序章に続き、2章ではそれ以降の章で提案するモデルの基本となる広告効果測定モデルを提示する。消費者ごとのパラメータに関して階層モデルを設定し、広告変数として家計ごとの残存効果パラメータから構成される広告ストック変数を用いることで、家計ごとに広告の残存効果とブランド選択に与える短期効果・長期効果の大きさを推定することを可能とする分析モデルを提案している。3章では2章のモデルを基本とし、広告残存効果に関して消費者間の異質性だけでなく、ブランド間の異質性をも考慮することで、家計別・ブランド別の残存効果と長期効果を推定する枠組みを議論している。4章においては、広告の閾値水準を家計ごとに得ることで、広告変数がブランド選択に影響を与えるためにどれくらい広告露出回数が必要かを議論する有効フリークエンシーの測定方法を展開している。5章では4章までの広告効果測定モデルに広告露出回数モデルを組み合わせることで、企業が直接管理できる広告出稿回数がブランド選択やマーケットシェアに与える影響を記述するモデルを提案し、さまざまな経営管理上の示唆を得ている。

本論文で扱う広告効果は広告の短期効果・長期効果・残存効果・閾値効果であり、先行研究では、閾値効果については集計データを用いた分析のみ、前3効果については非集計データを用いていたとしても、消費者間の同質性を前提としている。広告情報は本来消費者一人一人の中に蓄積されるものであり、広告費など企業レベルのデータではなく、消費者別または家計別の非集計データを利用した分析が望ましい。また現代のマーケティングでは、消費者ごとに異なるより細かいマーケティングを実施して効率を高めることが求められており、近年ますます消費者間の異質性を取り入れた分析が重視されてきており、広告効果の測定においても消費者各人に対する効果は異なり、これらを消費者選好の異質性の下で測定する枠組みの開発が求められている。本論文では、広告効果の測定に関してこれらの流れに沿い新しいマーケティングモデルを複数提案し、さらにベイズ統計によるマルコフ連鎖モンテカルロ法を駆使した新しい分析手法を展開して、実務上興味深い結論を多く得ている。

以上により、本論文は博士（経営学）の学位を授与するに値する論文であると認定する。